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Farms and Forests on the Carolina Foot-hills.

A GREAT deal has been written about the changes which have taken place in southern farms and in the condition and prospects of southern farmers since the war, but we have seen no more graphic picture of the foot-hill country of the Carolinas and the new life on the old plantations than that presented in a recent letter to *The Nation*, by Mr. C. Meriwether. With the social changes there depicted we have little to do, but discussion of the physical conditions upon which the new society is based is altogether within the field occupied by this journal. The locality from which this letter was written, and which it describes, is the broad strip of hilly country which slopes gradually toward the Atlantic and connects the low sandy coast levels with the Appalachian chain. The plantations in the neighborhood from which Mr. Meriwether writes averaged a thousand acres each before the war, and the same shiftless agriculture which was practiced by the old planters has been continued ever since. It is not a land of grass like New England or Kentucky, although there is no doubt that there are grasses and clovers which would turn the uplands into good pastures for grazing, and the brook-bottoms into meadows for hay. Cotton is the chief crop here, and when anything else is raised it is another hoed crop like corn, or potatoes, and there is never any sod to bind the soil to the ground. Nothing, therefore, prevents the rain from washing the light top-soil, with all its fertility, down the slopes. Every furrow between the rows of cotton or of corn, which were rarely planted across the line of the slope, invite fresh seams in the fields every year, and every rill which hurried to the rivers was laden with booty from the hills. No attempt was ever made to check the gullying force of the water which was forever robbing the land, and as soon as the field was impoverished beyond redemption it was abandoned, and a part of the forest was cut and burned over for another one, when the same old process of facilitating the transportation of its fertility to the bottom-lands began at once. In some of these old plantations of a thousand acres there are five hundred acres of gullies, and few more depressing spectacles can be imagined than these broad slopes which fifteen years ago produced a bale of cotton to the acre, now absolutely sterile and "a mesh of leaping torrents after every rain." Not only are the declivities barren and bare, but the valleys which they have enriched are becoming useless for agriculture, for the channels of the streams are filling up, and as there is no restraint upon the gathering waters from the slopes above, the crops on the bottoms are always threatened with a flood. In many of these abandoned hill-side fields the Old-Field Pine is springing up to restore the balance of natural forces which man has rashly destroyed, but a thousand years of rest will be needed before this denuded hard-pan will be covered with a soil that will be profitable to cultivate.

Plainly, there is no reason to hope that land which can be profitably tilled will ever be left forest-clad so long as the forest brings no money; but it is equally plain that the reckless destruction of forests and improvident tillage will soon turn this country into a desolation. While no accurate figures can be given, it is true even now, according to Mr. Meriwether, who writes with the caution of a skilled observer, that the land maintains to-day fewer people than it did in the times of slavery, and the best judges estimate that only about three-fifths as many people live on this foot-hill belt as once lived there. If as much effort had been intelligently given to protect a portion of the cleared land from washing as has been spent in cutting down the trees and burning over new land to take its place, a considerable part of what is now cleared would have been left as woodland, while the plow-land by judicious fertilizing, a careful rotation of crops and seeding to grass might have steadily increased in value, so that a quarter of the present cleared area would have been worth much more than the whole of it now is. And no man can estimate what the value of these forests would now be if they had been left standing and properly cared for. A North Carolina farmer who lived on a similar slope once said in our hearing that forty years before he had come into possession of, and moved upon, a tract of 1,300 acres of forest so dense, that, in his own picturesque language, "you could not shoot a rifle-ball a hundred yards in any direction without striking a tree." He had worked all these forty years in destroying this timber, and was almost as poor as when he began, and he added: "If I had left the wood all standing the Black Walnut and Yellow Poplar timber now on the tract would be worth alone as much as all the crops it has ever produced."

There is much other timber in that country besides Black Walnut and Poplar. As has been often explained in these columns, this southern Alleghany deciduous forest is not only the most beautiful in this country, and the richest in species, but it is one of the most valuable in the world, and much of it is certainly worth caring for with a view to an endless succession of timber crops. The land is rich not only on the foot-hills, but up to the very crests of the ridges in many places, and when the timber is stripped from these steeper slopes the soil will wash away with much greater rapidity than it has done on the foot-hills, and a few years will unfit them for plow-land or productive woodland. It is clearly the dictate of ordinary prudence that these high mountain crests should never be stripped of their forest-covering. The destruction of the forest here is destruction to the land below. It is clear, too, that wherever the land is so steep that it is impracticable by ordinary methods to protect it from gullying, the forest should be left there as well. It should be remembered that the chief reason for the luxuriance of this Appalachian forest is that the soil is good, and, therefore, there is greater temptation to improvident cutting. The people of that region are poor. They need all the money they can get. The temptation to sacrifice the future value of their land for ready cash is strong, so that just here is one of the fields where the foundation principles of good forestry practice, and the truth that irreparable loss and disaster must come from careless cut-

ting, should be disseminated in every possible way both by precept and example.

Last year we advocated the establishment of one or two great forest-reservations in this section where the trees had escaped the axe of the logger, so that future generations might see what manner of timber once grew here. Such reservations would have immediate value as an object-lesson, and the attention they excited might wake up the natives to an appreciation of the worth of the inheritance they were squandering. Again, if the experiment stations of the states in which these forests are situated should all take it upon themselves to investigate the best means of preventing the washing-out of soil by mountain torrents, and to explain to the people the part that areas of forest-land on the hills play in the protection of the slopes and plains, they would also teach lessons which could be utilized in immediate practice. Large tracts of this timber are passing into the hands of companies and individual capitalists of the north. Where these are bought for the timber alone, there will be danger that the rights of the people on the lower slopes will not be thought of, and that the wood will be taken for its immediate cash returns, but those who have bought this for a long investment, and the companies who have purchased tracts as parks or game-preserves, will render the state and the country good service if they secure expert advice in regard to the forest, if they show a genuine respect for trees and a desire to save them, and if they set forth in every possible way the truth that in a poverty-stricken country like this the waste of the forest is a criminal extravagance.

Notes on the Forest Flora of Japan.—XXIII.

IN cone-bearing plants Japan is somewhat richer than eastern America. All of our genera, with the exception of Taxodium, the Bald Cypress of the southern states, are represented in the empire, where two endemic genera occur, Cryptomeria and Sciadopytis, and where Cephalotaxus and, perhaps, Cupressus have representatives. In cone-bearing species, too, owing to the greater multiplication of forms of Abies, Japan is richer than eastern America, where we have only two indigenous Firs. The genus Pinus, which furnishes a very considerable part of the forest-growth on the Atlantic sea-coast, and which is represented here by thirteen species, has only five in Japan; and of these two are small trees of high altitudes, and one is an alpine shrub. Japan is richer than eastern America in Spruces, of which we have only two, in Chamæcyparis and in Juniperus. The two floras each contain a single Thuya, a Taxus, a Torreya, two Hemlocks and a Larch. In Japan, Conifers are more planted for shade and ornament than they are in America, or, perhaps, in any other country, although, except above 5,000 feet in Hondo, where there are continuous forests of Hemlock, they form a small part of the composition of indigenous forest-growth; and forests of Pines, Spruces or Firs, such striking features in many parts of this country, do not occur, except, perhaps, in northern Hokkaido, which we did not visit, and where there are said to be great forests of Abies Sachalinensis.

The Japanese Arbor-vitæ, Thuya Japonica, which is sometimes found in our plantations under the name of Thuyopsis Standishii, and which is more like the species of the north-west coast (Thuya gigantea) than our eastern Arbor-vitæ or Yellow Cedar, appears to be a rare tree in Japan, and we only saw a few solitary individuals on the shores of Lake Chuzenji and of Lake Umoto, in the Nikko Mountains. Here it was a formal pyramidal tree twenty or thirty feet high, with pale green foliage and bright red bark.

Thuyopsis dolobrata, which is, perhaps, best considered a Cupressus rather than a Thuya, is a tree of high altitudes. In the Nikko Mountains above Lake Umoto it is common between five and six thousand feet over the sea-level, growing as an undershrub under the shade of dense Hemlock-forests, and here, in favorable positions, sometimes finally rising to the height of forty or fifty feet, with a slender trunk covered with bright red bark, long, pendulous, graceful lower branches, and a narrow pyramidal top. This handsome tree finds its northern home on the mountains which surround the Bay of Aomori, in northern Hondo. It is a species which evidently requires shade, at least while young, and even the older plants, where we saw them, were always surrounded and overtopped by taller trees. The elevation at which it grows indicates that it should prove hardy here if properly protected from the sun, especially during the winter, for in Japan the young plants are not only shaded by the coniferous forest above them, but are buried during several months under a continuous covering of snow. Under proper conditions this tree should prove one of the best plants to form undergrowth in coniferous forests. The wood is considered valuable, and, owing to its durability, is used in boat and bridge building. We saw planted trees in the coniferous forests on the mountain-slopes near Nakatsu-gawa, in the valley of the Kiosogawa, but no other indication that it is valued as a timber or ornamental tree by the Japanese, who, according to Dupont,* have produced a number of varieties, of which the one with variegated foliage only has reached our gardens.

Of all the Japanese Conifers the most valuable is the Hi-no-ki, Chamæcyparis (Retinospora) obtusa. In the forests, planted on the lower slopes of the mountains in the interior of Hondo and in some of the temple-groves, notably in those of Nikko, this fine tree attains a height of a hundred feet, with a straight trunk without branches for fifty or sixty feet, and three feet through at the ground. At elevations between two and three thousand feet above the sea, usually on northern slopes and in granatic soil, which it seems to prefer, the Hi-no-ki is largely planted as a timber-tree; indeed, only the Cryptomeria, which seems to be less particular about soil and exposure, is more planted for timber in Japan. The tree is sacred among the disciples of the Shinto faith, and is, therefore, cultivated in the neighborhood of all Shinto temples, which are built exclusively from Hi-no-ki wood. The palaces of the Mikado in Kyōtō were always made of it, and the roof was covered with long strips of the bark. It is considered the best wood to lacquer; at festivals food and drink are offered to the gods on an unlacquered table of this wood, and the victim of harikari received the dagger upon a table of the same material. It is used for the frames of Buddhist temples and for the interior of the most carefully finished and expensive houses. The wood is white or straw-color, or sometimes pink, and in grade, texture and perfume resembles that of the Alaska Cedar, Chamæcyparis Nootkatensis. Like the wood of that tree, it has a beautiful lustrous surface, and is straight-grained, light, strong and tough, and remarkably free from knots and resin. In America we have no wood of its class which equals it in value, with the exception of that furnished by the two species of Chamæcyparis of the Pacific coast, and the Hi-no-ki might be introduced with advantage as a timber-tree into some parts of the eastern states, where it might find conditions which would insure its growth. It has proved perfectly hardy in this country as far north as Massachusetts, but the sea-level or the dry summers here do not suit any of the Retinosporas, which give no promise of long life or great usefulness anywhere on the Atlantic seaboard. They should be tried, however, on the slopes of the southern Alleghanies where they could find conditions not very unlike those in which they flourish in their native land.

The second species of Chamæcyparis, C. pisifera, the Sawara, is a less valuable tree than the Hi-no-ki, although the two species are always found growing together in plantations and in temple-gardens; indeed, they can only be distinguished after some practice, unless the cones are examined, although after a few days among them the

* *Les Essences Forestières du Japon.*

more ragged crown with its looser and more upright branches of the Sawara stands out clearly to the eye in contrast with the Hi-no-ki with its rounder top and more pendulous branchlets. The wood is of a reddish color, of a rougher grain and less valuable than that of the Hi-no-ki, although the two trees are planted in about equal numbers. As it grows here in our gardens, Chamæcyparis pisifera is a less ornamental plant than C. obtusa; it grows, however, more vigorously and promises to live longer and obtain a greater size. All the other Retinosporas of our gardens are juvenile or monstrous forms of these two trees. Some of the dwarf forms are much cultivated in Japan, especially as pot-plants, but they are not as popular there as I had been led to expect, and are most often seen in the nursery gardens of the treaty ports, where they are collected to please the fancy of foreign purchasers.

The most generally planted timber-tree of Japan is the Saké, Cryptomeria Japonica, and its wood is more universally used throughout the empire than that of any other Conifer. It is one of the common trees of temple-gardens and roadside plantations, and, when seen at its best, as in the temple-groves at Nikko or Nara, where it rises to the height of a hundred or a hundred and twenty-five feet, with a tall shaft-like stem tapering abruptly from a broad base, covered with bright cinnamon-red bark and crowned with a regular conical dark green head, it is a beautiful and stately tree which has no rival except in the Sequoias of California. Great planted forests of the Cryptomeria appear all over Hondo on broken foot-hills and mountain-slopes up to an elvation of nearly three thousand feet above the sea, low valleys and good soil being usually selected for such plantations, as the trees need protection from high winds. The plantations decrease in size and luxuriance in northern Hondo, and the cultivation of the Saké does not appear to be attempted north of Hakkodate where there is a grove of small trees on the slope of the hill above the town. The wood is coarse-grained, with thick layers of annual growth, dark reddish heart-wood and thick pale sap-wood; it is easily worked, strong and durable, and is employed in all sorts of construction. The bark, which is carefully stripped from the trees when they are cut down, is an important article of commerce and is used to cover the roofs of houses. A large round bunch of branchlets covered with their leaves hung over the door of a shop is the familiar sign of the dealer in saké.

Japan owes much of the beauty of its groves and gardens to the Cryptomeria. Nowhere is there a more solemn and impressive group of trees than that which surrounds the temples and tombs at Nikko, and the long avenue of this tree, under which the descendants of Ieyasu traveled from the capital of the Shoguns to do honor at the burial-place of the founder of the Tokugawa dynasty, has not its equal in stately grandeur. This avenue, if the story told of its origin is true, can teach a useful lesson, and carries hope to the heart of the planter of trees who will see in it a monument more lasting than those which men sometimes erect in stone or bronze in the effort to perpetuate the memory of their greatness. When the body of Ieyasu was laid in its last resting-place on the Nikko hills his successor in the Shogunate called upon the Damios of the empire to send each a stone or bronze lantern to decorate the grounds about the mortuary temples. All complied with the order but one man, who, too poor to send a lantern, offered instead to plant trees beside the road, that visitors to the tomb might be protected from the heat of the sun. The offer was fortunately accepted, and so well was the work done that the poor man's offering surpasses in value a thousand-fold those of all his more fortunate contemporaries.

Something of the beauty of this avenue appears in the illustration on page 446 of this issue, although, without the aid of colors, it is impossible to give an idea of the beauty of the Cryptomeria. The planted avenue extends practically all the way from Tôkyô to Nikko, but it is only when the road reaches the foot-hills that it passes between rows of Cryptomerias, the lower part being planted, as is the case with the other great highways of Japan, with Pine-trees; nor, as it has often been stated, is this avenue continuous, for whenever a village occurs or a roadside tea-house, which are scattered all along the road, there is a break in the row of trees, and it is only in some particular spots that a long view of continuous trees is obtained. The railroad, which follows parallel and close to the avenue for a considerable distance and then crosses it just before the Nikko station is reached, is a serious injury to it. The trees, as will be seen in the illustration, are planted on high banks made by throwing up the surface-soil from the roadway; they are usually planted in double rows, and often so close together that sometimes two or three trees have grown together by a process of natural grafting. Young trees are constantly put in to fill gaps, and every care apparently is taken to preserve and protect the plantation. How many of the trees originally planted when the avenue was first laid out in the beginning of the seventeenth century are left it is impossible to say, but I suspect that most of those now standing are of much later date. One of the trees close to the upper end of the road which had been injured by fire was cut down during our visit to Nikko. The stump, breast-high above the ground, measured four feet inside the bark, and showed only one hundred and five layers of annual growth. Few of the trees in the avenue were much larger than this, although in the neighborhood of the temples there are a few which girt over twenty feet; these were probably planted when the grounds were first laid out.

The two, Chamæcyparis and the Cryptomeria, the most valuable timber-trees in Japan, are now almost unknown in a wild state. They may, perhaps, be found growing naturally on some of the southern mountains which we did not visit; wherever we went, however, we saw only trees that had been planted by man, although some of the plantations had evidently lived through several centuries.

C. S. S.

The Pines in October.

No frost has touched the Pines, and the old but ever-new panorama of autumnal color glowing in leaf and flower is again spread before the eye. The Swamp Maples have donned their deepest crimson and scarlet, and vie in brilliancy with the Tupelos, whose spray-like horizontal branches are covered with small fiery leaves. The Sweet Gum, too, is a grand factor in this color-scheme. No tree of my acquaintance takes on so many varied hues. The leaves on some of the trees are a deep purple, on others a rich chocolate-brown, on others still they are crimson and scarlet, while some turn yellow, blotched and marbled with pink, and whatever their color the deep-lobed fragrant leaves shine as if they were varnished.

The Hickories and Birches supply the main yellow in this field of color. The sturdy Oaks are slow to lay aside their rich summer green, and only here and there are the leaves tipped with crimson and scarlet. The Chestnuts also continue green, with only now and then a faint tinge of yellow. The aromatic Sassafras is brilliant in yellow and scarlet, while the Sumach and many shrubs in the Heath family have turned a deep crimson, shading to purple. Many old trees and stumps are clothed from base to summit with Ampelopsis in most brilliant tints of crimson and scarlet, intermingled with clusters of dark purple berries.

The Asters and Golden-rods were never more beautiful than they are this October. The dry, hot summer has kept them back until the cooler weather of late September and October came, when all the waste places and woodlands were suddenly ablaze with gold and azure. Many other flowers are still blooming freely, among them Rudbeckias and Helianthus, especially the pretty Helianthus angustifolius, which belongs exclusively to the Pines. The Golden Asters, Chrysopsis Mariana and C. falcata, are both here, their disk and ray flowers all bright yellow. Diplopappus linariifolius, with large showy heads and light purple rays, mingles abundantly with Chrysopsis, as does also the Blazing-star, Liatris spicata and L. graminifolia, which have handsome rose-colored flowers on long wand-like stems.

In places more marshy are the large Burr Marigold, with

very showy golden-yellow flowers. The little Orchid, Ladies'-tresses, with its spike of deliciously sweet-scented, pure white flowers, is quite common in damp places. Two or three species of Eriocaulon, which are almost entirely confined to our wet Pines, are still in blossom on long scapes terminated with a single head of dullish lead-colored flowers.

Many Grasses and Sedges are now beautiful, as the long, drooping umbels of Scirpus, Eriophorum and the Cotton Grass, with its soft dense white or copper-colored heads. These Sedges blend beautifully with some of the Grasses and the seed-vessels of many plants now abundant in all the Pines.

Vineland, N. J. *Mary Treat.*

Foreign Correspondence.

Notes from Cornwall.

I HAVE lately spent a fortnight in Devon and Cornwall, chiefly walking about the moors and along the cliffs of the north side, where the scenery and air are delightful and health-giving. The moors are remarkable for the production of good mutton and sturdy little ponies, and some of them, at least, for a display of Heath and Furze. I have never seen anything more beautiful than the moors about Minehead, where one walks for miles through great cushion-like masses of purple Heath and dwarf Furze, both in flower. Ferns have had a bad time of it this year, and the Devonshire lanes were therefore a disappointment. The gardens in the south of Cornwall have a special attraction for horticulturists, many plants thriving out-of-doors there which in other parts of England must be grown under glass. The following notes were taken during a three-days' ramble in the neighborhood of Falmouth:

Himalayan Rhododendrons are a feature of open-air gardening in south Cornwall. In several gardens near Falmouth, notably that of Mr. Shilson, at Tremough, there is a large collection, and all the best-known species are represented by enormous specimens. Another fine collection is that at Carclew, the residence of Colonel Tremayne, where, also, very fine examples of rare Coniferæ may be seen. There are also many large specimens of Rhododendron and other tender shrubs and trees in the garden of Miss Fox at Penjerrick. Falmouth is exceptionally favored in regard to climate, and, apparently, also in regard to good soil, for these Himalayan Rhododendrons. I was informed by Mr. Shilson's gardener that eight degrees of frost is about the average maximum of cold experienced in the neighborhood of Falmouth, and that heavy mists and rain are common at all seasons of the year. He said the climate of this town is remarkable for equability and mildness, in proof of which exotic plants flourish the year round in the open air. Mr. Fox, of Grove Hill, obtained the Banksian medal about thirty years ago for acclimatizing upward of two hundred foreign plants.

The Rhododendrons at Tremough are nearly all veterans, having been raised from seeds obtained from Kew soon after their first introduction by Dr. Hooker, now forty years ago. They are now almost the sole occupants of very large shrubberies and spacious beds in various parts of a large garden, and there are also numerous specimens among the trees in the woods which partly surround the place. I measured some of the largest specimens, the dimensions of which may interest those readers of Garden and Forest who are able to grow these glorious shrubs out-of-doors in the southern states: R. arboreum, trees thirty feet high, with trunks a foot in diameter; R. niveum, a perfect, spherical bush twelve feet high; R. Falconeri, twelve feet high, a grand specimen with large leathery leaves, a striking object at all times, but a magnificent sight when bearing scores of large trusses of flowers, as it does annually here; R. barbatum, ten feet high, and furnished with branches down to the ground; R. campanulatum (Wallichianum), abundantly represented by very large bushes; R. ciliatum, the largest plant I have ever seen, a bush six feet high and at least twice as much in diameter; R. arboreum roseum, R. Shepherdii, R. cinnamomeum and R. Thomsoni, all much larger than we are used to see them even under glass. A hybrid between R. Thomsoni and R. barbatum, raised in this garden, and named R. Shilsoni, is similar to the former in leaf and habit, differing only in the size of its heads, the color of the flowers and the shortness of the flower-stalks, in which characters it is superior to R. Thomsoni, which is saying a great deal. R. Aucklandii, a delicate species as a rule, is in rude health and ten feet in height. Seedlings are to be seen springing up in those parts of the garden that escape the hoe. In all the species there is considerable variety observable in the foliage and habit of the many representatives. Azalea Indica is as plentiful and large as the common Cherry Laurel is in northern gardens, while Camellias occur frequently, and always in good health. As a rule, perfect flowers are cut from them for decorations at Christmas. At the time of my visit, the Belladonna Lily was the glory of the garden. Among the Rhododendrons, along the carriage-drive, against the terrace-wall, and even in the kitchen-garden, the flowers were as thick as Cowslips in an English meadow. "We don't think much of the Belladonna here," said the gardener; "it is too common." In the same garden a great bed on a large open lawn was filled with Yucca gloriosa and Y. recurva, about thirty plants altogether, with rosettes a yard high, and each bearing a spike another yard high, clothed with white waxy bell-flowers. They were a real picture, and appealed to us as a piece of good gardening. Against the entrance, with its roots half-choking a stream beside which it had been planted, stands a fine example of Aralia spinosa. It is thirty feet high and thirty-five feet in the spread of its branches, its stem nine inches in diameter, and its flowers and fruit abundant. A few yards further on we saw a cottage almost entirely enveloped in a thick cloud-like mass of Solanum jasminiflorum, partially hiding the roof, and even the chimney, with its healthy green leaves and thousands of clusters of white starry flowers. This and the hardy Fuchsias (F. globosa and F. coccinea chiefly) are favorites with the cottagers in Cornwall, where we saw many beautiful effects made by one or the other, and sometimes by the two combined, as they grew against the cottages by the road-side.

In Colonel Tremayne's garden, Rhododendron arboreum is even larger than the largest at Tremough, having a stem four feet in circumference, while R. Hodgsoni is a great bush fifteen feet through. R. Falconeri is twenty feet high, and this summer bore ninety-six trusses of flowers. I have never seen a more charming garden than this at Carclew; indeed, I question if there is anything better in Cornwall. The Coniferæ are magnificent: Abeis Smithii, eighty feet high; Tsuga Albertiana, the same; Pinus patula, a magnificent example; Pseudolarix Kæmpferi, the Golden Larch, is thirty feet high and would have been much higher had its top not been broken off by a storm a few years ago; its trunk is exactly eighteen inches in diameter. Phyllocladus rhomboidalis, the Celery-topped Pine, is represented by a handsome specimen fifteen feet high. An interesting feature of this garden is the Lucombe Oak, of which there are numerous very large trees, ninety or a hundred feet high, with trunks as straight as Pines and measuring twelve feet in circumference. The Lucombe Oak (Lucombe was gardener at Carclew) is an accidental hybrid between the Cork Oak and Turkey Oak. There are also in this garden a number of hybrids between other Oaks. Of the genus Pinus there are rare species from Mexico, India and California. Loudon described many plants flourishing at Carclew as either quite irregular or in a state of growth not to be seen at other places. Enormous bushes of Leptospermums, Embothrium coccineum, Azaras, Berberis Japonica, var. Beali, a grand shrub, and Benthamia fragifera, a common tree covered with its large strawberry-like fruit, are among the many things I noted. A path bordered by clumps of Himalayan Rhododendrons, White Azalea indica, Azalea mollis and Embothrium must be a beautiful picture in May or June when they are in flower. Among many features of interest noted in the glass-houses two call for special

mention. First, a collection of seedling Dipladenias, all from seeds of D. Brearleyana, and showing wide variation of color, from pale rose to cerise and purple. They varied also in the size and form of the flowers, and indicated that a great deal might be done with Dipladenias, if the seeds of the garden varieties were sown. The second feature is Poinciana regia, the Goolmore or Flame-tree of the east, which I have never seen in bloom in England, but which is flowered every year at Carclew by keeping it pot-bound and training its branches against the glass in a sunny stove-house. Myrtus Ugni is grown as a kitchen-garden plant, its fruits being made into jam.

At Enys, the well-wooded demesne of the old Cornish family of that name, there are some interesting and rare New Zealand trees and shrubs: among others, Fagus Cunninghamii, twenty feet high; Pittosporums, thirty feet; several species of Eucalyptus, a fine bush of Olearia argophylla, the Musk-tree; another of Laurelia camphora, while Lomaria procera, with fronds as large and rigid as a Gamia, is common and apparently wild in the garden. Photinia serrulata is thirty feet high and twenty feet in diameter, with a trunk a foot through. Myosotidium nobile, a rare and handsome herb from New Zealand, is represented by a large clump suggesting a good stool of Rhubarb; the leaves are crowded on stout stalks, the largest over a foot in diameter. Desfontanea is a common bush in the garden and is nearly always in flower. Magnolia Lenniana, a variety of M. conspicua, was in flower, and is a very handsome plant, the flowers being large and of a rich claret-red color. Leptospermum scoparium is a tree there fifteen feet high, and when in flower it is like a pillar of snow. The woods are rich in big specimens of Turkey Oak and fine Silver Firs, some of them 120 feet high, with grand mast-like trunks. Cupressus macrocarpa, the pride of Cornish and Devon gardens, is represented at Enys by enormous trees, one I measured having a trunk three and one-half feet in diameter. A lake in the lower part of the garden is very picturesque, being surrounded by suitable Reeds, Ferns, etc., while the banks are covered with a thick mass of Primula Japonica. This plant has taken entire possession of the whole of the margin of the lake, and would, if allowed, soon obliterate the paths, seedlings coming up in dense turf-like masses. In early summer when this Primrose is in flower it must be very fine.

In the gardens at Menabilly, the seat of Mr. Rashleigh, there are many rare and fine examples of Coniferæ. I saw there Athrotaxis laxifolia, fifteen feet high; A. imbricata nine feet high; Pinus oocarpa, twenty feet high, a broad, thick-stemmed specimen; P. parviflora, nine feet high, said to be the largest example of this rare Pine in the United Kingdom. P. Montezumæ, twenty feet high, and as wide; Picea Ajanensis, P. Webbiana, Abies grandis and A. Pindrow, each in fine, vigorous health and about twenty feet high, while a beautiful little specimen of A. religiosa is nine feet high. Retinospora leptoclada is seven feet high. The genus Podocarpus is also represented by large examples. It will afford some idea of the suitability of this garden for Conifers if I give the measurements of a pair of Pinus insignis which were planted in 1838 by Mr. Rashleigh; these are now seventy feet high, with trunks four feet in diameter.

Escallonias are notable sea-side shrubs, and in some parts of Cornwall, E. macrantha is a common hedge-plant, and a very fine hedge it makes. The large waving plumes of the beautiful Bamboo, Thamnocalamus Falconeri, occur in many places in Mr. Rashleigh's garden, and always with telling effect. Indeed, these and thousands of bushes of Hydrangea hortensis, all bearing big bunches of rich blue flowers, are special features at Menabilly. An avenue planted with Yuccas, Chamærops Fortunei and Bamboos will be very effective in fifteen or twenty years. The true Dracæna, or Cordyline indivisa, is here represented by large specimens with stems six feet high, bearing large heads of leaves six inches wide and three feet long, their color yellowish green, with brown stripes. The lawns are full of Daffodils and other spring-flowering bulbs, the woods carpeted with hardy Cyclamens, and everywhere there are big bushes of Himalayan Rhododendrons. The Chilian Raphithamnus cyanocarpus, a Myrtle-like bush twelve feet high, was laden with bright China-blue fruits when we saw it. Callistemons, Hakeas, Eurybias, Embothrium, Pittosporums, and even Acacias, are all represented by big bushes. Litsea reticulata is a tree thirty feet high, and Rhododendron Falconeri a magnificent specimen. Abutilon vitifolium album is at home on the lawn, forming a large shrub and flowering freely in summer. Where it is happy, this is one of the most beautiful of all malvaceous plants.

There are so many choice and tender plants in these Cornish gardens that one wishes to see many of the newer things tried there. So far as I could understand the conditions, they are favorable to all the plants that can be cultivated in the open air in England, and also to a great many which, even at Kew, have to be grown under glass. Cornwall might easily be made a gardener's paradise, and there are, no doubt, many other places in the world where a little gardening enthusiasm, rightly applied, would add materially to their beauty and interest.

London. *W. Watson.*

Cultural Department.

Dahlias.

MR. ENDICOTT'S exception to my advice to grow single Dahlias as annuals seems well taken from his point of view. He speaks as a Dahlia fancier, and, of course, one who has a special fancy for a particular flower will only be satisfied with the best forms attainable, and these are seldom or never to be had when dependence is placed on seedlings. To gain the finest forms of Dahlias, many crosses and careful selections have been made, with certain points in view. This is a flower of so sportive a character that a lot of seedlings would probably show only a small proportion of forms satisfactory to an amateur in Dahlias, and such a grower is quite right in spurning my advice. However, there are those, like myself, who only care for the Dahlia as a high-colored, showy flower, useful in the garden in the fall. Such persons are in the majority, and to these my advice will be found sound, as applied to single Dahlias in general, and the dwarf strain of these in particular. Single Dahlias and Zinnias, which I treat alike, are the brightest of flowers, and quite indispensable where showy ones are desired. They are especially valuable, as they give us a range of colors beyond the yellows with which our gardens are usually filled in the later part of the season. My friends, to whom I have distributed some of this strain, have all been especially pleased with them, which adds to my confidence, as my selections do not always meet with enthusiasm. I fancy these seedling dwarf Dahlias because they give so little trouble while growing, and the plants require no staking. The flowers, with slight exceptions, are very attractive, usually fair-sized and pure in color. There are fine shades of self-colored reds from nearly black to pink, and also whites and yellows. Among them are also the blotched or striped kinds —panaché—on various colored grounds, which are odd, and, in some cases, attractive. In my small garden it does not pay me to grow the Cactus Dahlias, which I fancy next to the singles. They make great bushes which require staking, and are not very free-flowering. The handsomest of all Dahlias is D. imperialis, but this is a subject for the greenhouse, as it flowers late in the year. A well-flowered plant of this variety is a picture of superb beauty of form. Back of my greenhouse, my neighbor grows a good collection of named double Dahlias, and I discuss their points with him, but really do not care for them nearer by. They make a great mass of handsome colors, but they are unmistakably lumpy. Still, these are matters of taste, and, perhaps, fortunately, we are not all pleased with the same things.

On the whole, there are no more satisfactory flowers grown than the old favorites, such as Dahlias, Marigolds, Zinnias, Nasturtiums and other garden-plants familiar to us from childhood.

Most of us have associations or recollections connected with one or more of the common flowers by which they are endeared to us, and the rarest introductions of new kinds fail to give us really as much pleasure. Probably, most owners of gardens, if asked to select the flower which they would grow if confined to one sort, would name one of these old garden friends.

What could be more gay and more satisfactory, for instance, than a garden of Nasturtiums? There does not seem to be any sentiment connected with these, but in every other respect they seem among the plants with which one would last dispense.

Elizabeth, N. J. *J. N. Gerard.*

New and Rare Plants at Baden-Baden.

KNIPHOFIA NATALENSIS has been spoken of by a celebrated Dutch nurseryman as worthless because of its lax spike and lack of brilliant color. The plant, however, is exceedingly variable, and a few may be found in every hundred which are very beautiful in form as well as in the color of the flowers. Besides, it seems capable of producing hybrids of a striking new race, the spikes of which become longer and more loose and show very pleasing color.

Gladiolus oppositiflorus has been flowering freely for some time past. Apart from its value for the purpose of the hybridizer, it is a very showy plant, the spikes growing to a height of five feet, the flowering portion being from one to two feet long. The flowers, which vary from white to rose or purple, more or less pale or deep, are comparatively large, delicate in structure and arranged in two opposite rows. I have counted on one spike twenty-one flowers open at once.

Scabiosa Caucasica alba is a first-rate novelty which flowers very freely, and promises to be of much use for cutting purposes. Salvia Hydrangea is another striking novelty which I have been successful in securing from Persia. The flowers are arranged in a thick spike; they are pink, and each one is surrounded by two large bracts of a brilliant deep rose color. Crocus pulchellus, a variety from the island of Thasos, is charming just now. The color of its flowers is a most delicate lilac.

Among shrubs Cratægus Korolkowi (syn. C. Tartarica major) is a picture of beauty, the bright crimson fruits, each as large as a big cob-nut, are arranged in clusters of from six to twenty-five, and the trees are laden with these clusters. It is a striking small tree for autumnal decoration.

Baden-Baden. *Max Leichtlin.*

Late Flowers on Woody Plants.

THE second or continued and late flowering of woody plants should not, as a rule, be too much desired for, because it often leaves the plants ill prepared, on account of the immaturity of their wood, to withstand the severe winters which closely follow in northern latitudes. This, of course, applies mainly to such plants as normally produce their regular crop of bloom earlier in the season. The second bloom is produced on new shoots, and the act of flowering out of season means that just so many flower-buds are lost to the normal flowering of the following summer. It is true that some of these plants are practically continuous in their flowering from the time the first blossom-buds open until further development is checked by cold weather. Such species are, perhaps, not so likely to feel the effects of winter as those which make an unnatural, so-called second growth. Young plants in rich soil are also more likely to produce late flowers than are older plants which have been long established.

Hall's Japanese Honeysuckle is one of the best examples of the ever-blooming class, as it shows no cessation and little diminution in flowering from the time that its first buds open in June until many of our deciduous trees are leafless in the

Fig. 66.—The Avenue of Cryptomerias at Nikko, Japan.—See page 442.

autumn. Together with the later flowers ripe black fruits may also be seen in abundance. This is altogether one of the most satisfactory of twining Honeysuckles as well as of constant bloomers. Its strongly and sweetly fragrant flowers are at first white, but change to a light yellowish color as they grow old. The plant is quite hardy in the climate of Boston, and the leaves persist on the stems and maintain a bright evergreen appearance until well into the winter. It is curious that what is considered as the type of the species does not show any tendency to blossom at any other than the usual time.

The little Saint Dabeoc's Heath, Dabœcia polifolia, is another plant which, in this climate at least, persists in blossoming in more or less profusion throughout the summer and autumn. It is rather too delicate and tender to be recommended for general cultivation here, but plants in the Arboretum have stood in the open ground for several years by having a good covering of leaves and branches in winter. It has slender, low-spreading stems, scarcely rising over a foot in height, and dark little evergreen narrow leaves, which, on the lower surface, are usually of a very pure white color. The flowers of different forms are white, purple or rose-colored. They are somewhat barrel-shaped, from a third to half an inch long, and are borne in ascending, loose terminal racemes, each blossom on a short separate stalk or pedicel. It is indigenous in south-western Europe and the Azores, and is also found wild in Mayo and Connemara, in southern Ireland.

The large flowering St. Johnswort, known as Hypericum calcinum, at first sight seems more like an herbaceous plant than one which is truly woody, but an examination of the lower parts of the stems at once shows their ligneous character. This pretty golden-yellow blossomed plant scarcely rises more than a foot in height here, and although it never at any season bears a profusion of flowers, a few scattering specimens may almost invariably be found from midsummer until frost. Except yellow Roses, these St. Johnswort flowers are about the largest of any flowers of that color borne on outdoor woody plants which are hardy in this latitude. This Hypericum is not as hardy as could be desired, and unless it has the protection of a covering, such as dry leaves, in winter, it is liable to be much winter-killed, and its dark, persistent foliage is destroyed. There are two or three other species of foreign St. Johnsworts which also continue to bear a few flowers until frost overtakes them, the most noticeable being Hypericum multiflorum and H. hircinum; and, among native species, young plants of H. galioides and H. densiflorum bear a few straggling flowers.

Besides St. Dabeoc's Heath, too, there are one or two others of the same family which have hardly finished their belated flowering as yet. Erica Tetralix still bears a good many fresh heads of its pretty rosy-red flowers, and the uppermost buds in some spikes of the Cornish Heath, Erica vagans, have not yet expanded and shown their pinkish white corollas and dark purplish anthers.

Clethra tomentosa, which by many botanists is considered as simply a southern form of our northern and earlier-blooming C. alnifolia, has hardly passed out of its legitimate flowering when it is overtaken by frost. Where the sweet C. alnifolia is grown in gardens, C. tomentosa is worth planting for its succession and continuance of bloom when the first has long faded. Among other plants noted in mid-October at the Arboretum as producing late blooms the following may also be mentioned: Daphne Cneorum, with a few clusters of flowers, just as fragrant as those borne in June; Rosa rugosa and its pretty white variety, with very large single blossoms on stray new shoots, and incurring less liability to have their petals marred by the bites of insects; Bladder Senna, Colutea arborescens, and Weigelas, or Diervillas, bearing good blooms on young shoots. Among the Spiræas some of the forms belonging to the group known as S. Japonica or S. callosa still produce blossoms, a white-flowered form, and the red-flowered one, known in nurseries as S. Bumalda, showing them most plentifully.

Unfortunately, none of the Pacific-coast species of Ceanothus having colored flowers are really hardy in this climate; but for the past two seasons roots of the form of C. azureus, known as Gloire de Versailles, have survived in a sheltered situation, and throughout the autumn have borne numerous large handsome panicles of small azure-blue flowers on vigorous new stems.

Arnold Arboretum. *J. G. Jack.*

Notes from the Home Vineyard.

AMONG the advantages of an experimental vineyard consisting of a hundred or more varieties, over the purely commercial grapery, is the perfect pollen-transfer which this massing of varieties secures. The reputation which some varieties have of being "shy bearers," or of giving only loose clusters, is mostly the direct result of a failure in self-pollination and consequent partial fruit-setting. Whenever a large number of varieties are crowded together side by side, free fructification is sure to follow.

Brighton, one of the best varieties for both home use and market, for example, is usually described as bearing loose clusters. Ever since it came into bearing in our experimental vineyard, three years ago, this variety has produced as much fruit on each vine as Concord or Niagara, and in finer clusters, being the largest and handsomest among all our varieties; some clusters weighed a pound, and few less than half a pound apiece.

Eldorado, a great favorite with us for its pure flavor and generally superior quality, bears, under our vineyard conditions, a moderate amount of reasonably fair clusters, which, however, are none too compact. In its first bearing season, two years ago, the Eldorado gave as much fruit as the most prolific varieties, and in good clusters. Last year it was somewhat of a failure, owing chiefly to rot. This year it has again borne well, but the vine seems to be more subject to disease than any of its near neighbors.

The Best Grape. The Concord is the choice of most people when there is room for one vine only. I should unhesitatingly select the Green Mountain (Winchell, of Ellwanger & Barry). A vine of this variety may not yield as many pounds as a Concord or Niagara, but it gives clusters of luscious fruit at a time when grapes are scarce, and seem to be most appreciated, as they are worth ten or fifteen cents a pound, while Concords can be had at one-fifth that price in their season. Whoever appreciates extra quality, and is willing, as all should be, to incur some slight trouble and expense for it, may bag part or all of the clusters, not only on the Green Mountain, but on other good sorts as well, thus keeping the bunches free from dirt, chemicals, and especially from spiders and insects (one of the greatest objections to the average grape of our markets), all the bloom intact, and the berries reasonably safe from mildew, rot and frost.

Pruning and Training.—There is no occasion for even the novice to be afraid of the pruning and training of Grape-vines. To insure a tidy and attractive appearance, the horizontal-arm system and a four-wire trellis can be recommended, although prompt attention is necessary in the tying. When fruit is the chief or only consideration, a trellis of one or two wires can be made to answer, and the labor of training reduced to a minimum. The amateur seldom realizes the necessity of severe pruning. Usually too much wood is left, and the vine sets more fruit than it is able to bring to perfection. Late sour grapes and often lasting injury to the vitality and endurance of the plant are the results. I have often had to cut a large part of the clusters away when half-grown, and later in the season have found that far too many had yet been left on for the good of the crop and the vines. Close pruning will prevent overbearing. With the exception of four short arms of new wood, two for the lower and two for the upper wire, we cut all wood away clear to the main stem or stems, of which there are usually two, and then tie the arms as required. This is all the labor of this kind done in the vineyard until August, when we go through once more to arrange the new growth about the vines and clear out the tangles. This is not the most thorough way, but it has given us an abundance of good fruit at little labor and expense.

Spraying for Disease.—Until the first bearing season of the vineyard, and during that season, the vines were entirely free from disease. But after the strain endured by the vines in bearing a very large crop, diseases seemed to find an easy hold, and last season probably over one-half of the clusters were ruined, no preventive measures having been used. The whole vineyard is now thoroughly and evenly infected with anthracnose, black-rot and downy mildew. Earlier experience had shown me that the treatment of the dormant vines in early spring with strong solutions of sulphate of iron, ordinary green copperas, is of far greater potency than later treatments with Bordeaux mixture or any other of the well-tested fungicides, and that these applications, if persisted in year after year, will alone suffice to clear out every trace of these vine diseases. Usually I have made two applications, one while the vines were perfectly dormant, the other when the buds were ready to break. An almost saturated solution of the drug was used and the spray thrown upon the wood, the wires, the posts and the ground almost to the point of soaking. This year only one application was made, four rows of the vineyard being left without treatment. Although fungus has not been general this year, there are slight traces of mildew and rot in

all parts of the vineyard; but the difference in the spread of these diseases between the treated and untreated parts was a subject of comment all during the latter part of the season, and was truly remarkable. In the treated rows, with the exception of Delaware and Moyer, which were more seriously affected by downy mildew on the foliage only, the vines have retained healthy leaves to the last, and only few plants show slight touches of rot on the berries. In the untreated rows only very few moderately healthy vines can be found. The majority have had much of their fruit spoiled by black rot, and a number of them have been entirely defoliated by downy mildew. This is an object-lesson well worth remembering. The sulphate of iron solution is cheap, easily applied, and if used with thoroughness, preferably in two applications every year, will surely give good results in banishing the dreaded grape diseases. I have no doubt that a similar course of treatment would work well for the various blights of fruit-trees, especially Apple-scab. We can make short work with the comparatively few spores which have found lodgment on the dormant wood, by spraying the comparatively small surface with solutions far too strong to be used safely on the well-developed foliage, and on a much greater surface. In short, a thorough use of strong iron sulphate solutions will enable us to dispense, perhaps, entirely with Bordeaux mixture and the various other fungicides.

La Salle, N. Y. *T. Greiner.*

Correspondence.

The Common Names of Wild Plants.

To the Editor of Garden and Forest:

Sir,—Knowing that you and your readers are interested in the common names for wild plants, which vary so greatly in different parts of our country, I am tempted to note that the name "Biscuit-leaf," or "Biscuit-plant," which, in an article called "Nibblings and Browsings," in the September *Atlantic*, Mrs. Bergen gives as familiar in eastern New England for Smilax rotundifolia, is quite unfamiliar in the eastern part of Connecticut. There we called it Bread-and-butter Vine as well as Cat-brier and Bull-brier. Mrs. Bergen says, again, that the Oxalis and the little Rumex are both "generally known to children as Sorrel, though in Pennsylvania, I hear, they call the Oxalis Sour-grass." Sour-grass was our only name for the little yellow-flowered Oxalis in Connecticut; only the Rumex was called Sorrel. Our only name for what Mrs. Bergen describes as "the keenly biting Smartweed" was Pepper-grass, a term she does not cite.

New York. *H. T. F.*

Canada Thistles.

To the Editor of Garden and Forest:

Sir,—A note in your paper on the destruction of weeds reminds me of a controversy I once had with Canada Thistles. I had some three acres of neglected land that had been turned to pasture. It had formerly been neglected and used for burning brush-piles, so that Canada Thistles took possession, as they always do on burned land, and that after it was planted with Corn or Potatoes, so that two years ago it was literally covered with a rank growth of these weeds. As an experiment I took a clod-crusher, made of two-inch plank, loaded it with as much stone as the horses could draw and broke the thistles down flat and then plowed them deeply under. The plan succeeded perfectly. It seems that their entire vigor, vitality and substance was then in their tops, as they were ready for scattering the seeds. They were entirely destroyed, and a market-gardener raised vegetables on the land the next season. Not a sign of a Canada Thistle has been seen on the ground to this day.

Waukegan, Ill. *Robert Douglas.*

Why Dahlias Fail to Bloom.

To the Editor of Garden and Forest:

Sir,—Having seen in your issue of October 4th a complaint that Dahlias had failed to flower, I venture to report my own experience. For a few years past I have attempted to get Dahlias to flower, but all efforts have proved useless. I tried many varieties, but, as regards flowering, they all proved much alike.

At first my impression was that they needed a soil somewhat richer in order to mature their flower-buds, but that produced no better results, and I then tried the opposite plan, thinking that, perhaps, I could starve them into bloom. The result was much the same as in the first experiment, with the exception that in the rich soil the plants made stronger growth and more and larger tubers. I then kept close watch to see if they were preyed upon by some minute insect, and was at last disagreeably surprised to find, busy at work, the same insect, Lygus lineolaris, which preys upon the Chrysanthemum. To explain how it works would only be repeating what has often been told already, and I fear that nearly all florists are only too well acquainted with this little pest. As in the case of the Chrysanthemum, I find that the flower-buds, as well as the leaves, fall a prey to this insect, and when once stung they never seem to develop. Sometimes a bud may not be so much affected as to prevent its opening, but when this is the case the petals on one side of the flower will be found wanting. There may be other reasons for the failure of Dahlias to flower satisfactorily, but this one is more than sufficient to cause great disappointment, and the only one I have so far been able to detect.

Whitinsville, Mass. *Charles Strachan.*

The Columbian Exposition.

The Greenhouse Exhibits.

THE greenhouse displays at the World's Fair are disposed, for the most part, upon the lawn in the rear of the Horticultural Building, although three of them are inside the building. The exhibits are not numerous, but they represent the recent improvements in construction, and they may be taken, as they stand, to indicate the present stage of our progress in greenhouse-building. One familiar with the houses of twenty years ago sees great changes. Large glass, exceedingly light frame-work, the free use of iron in the construction and the abandonment of the old point-and-putty system of glazing are the chief innovations; and one might add, also, the construction of portable houses. The fears attending the use of iron for greenhouse construction have now subsided, or have been overcome. Rafters, only a half-inch thick and three inches wide, are strong enough to hold a roof thirty feet high, without a post. Glass is both lapped and butted in the various houses, although the lapped is more used. Except in some patent systems of glazing, wooden sash-bars are still used.

The two most comprehensive displays are those of Hitchings & Co. and Lord & Burnham, immediately back of the Horticultural dome. The former show an admirable fancy Palm-house, 34 x 50 feet, and 30 feet high, which is free from all posts and troublesome braces. A greenhouse wing, 19 x 35 feet, is attached at the rear. The entire plant, with slate and tile benches, heated, can be built for $8,500. The construction of this house is exceedingly light. Lord & Burnham show a nest of three houses and a connecting work-room. The largest house, of which the centre is a Lily-tank, is 25 x 50 feet. The greenhouse wing is 20 x 33½ feet, and the Rose-house 18½ x 33 feet. This plant complete, heated, can be built for $6,000. Two other houses are also shown by Lord & Burnham, one a curvilinear greenhouse, 15 x 30 feet, costing $900; the other, a portable house 10 x 20, costing $400. Hitchings & Co. also show two sections of a portable iron-frame greenhouse in the dome-gallery of the Horticultural Building. A villa conservatory is shown upon the lawn by Thomas W. Weathered's Sons, and a portable wood-and-iron frame-house is shown by the same firm in the south floral curtain of the Horticultural Building. This latter house is 11 x 27, and can be built, complete, for $575. The glass is set in light sashes, which are bolted and screwed to the frame-work. John C. Moninger, of Chicago, has a small house, 20 x 30 feet, upon the lawn, to show the use of Cypress lumber in the construction of a house; and in this house Mr. J. D. Carmody, of Evansville, Indiana, displays his sectional boiler for hot water, and his New Departure ventilating appliance. The Hellemell system of glazing is shown in a small portable house upon the lawn, built by Mr. H. B. Hardt, of Chicago. This system, which is an English patent, and not in use in this country, is a zinc sash-bar and cap, the cap being screwed down into the bar in much the same manner as our common wood sash-bar and cap for butted glass are used. This system allows of either lapped or butted glass. In the north floral curtain of the Horticultural Building, A. Edgecumbe, Rendle & Co. show their two patent systems of glazing, the "Acme" and the "Paradigm." These systems consist in the use of metal sash-bars, fitted in such shape that the glass slides into them, and is held secure without resort to putty. The sash-bars are quite independent of the structural frame-work of the house. The system can be used either upon wood or iron frame houses, and it is particularly adapted to heavy skylights. The Rendle

Co. also has two iron skeleton houses upon the lawn to show the method of building iron frames.

The most novel of the various greenhouse exhibits are the two curious structures made of the Falconnier glass bricks. These bricks are essentially bottles without an opening, and blown in such shapes that they fit well into the designs of the builder. As a rule, the interior hollow is about large enough to hold a quart of liquid. The bricks are generally flattened, but the two broad sides are usually raised into a cone-like shape, in order to present various surfaces to the incident rays of the sun and to break the force of hail and shocks. The narrower sides are two or three inches wide and are trough-shaped to hold the cement or mortar with which the bricks are joined. The bricks are laid by a mason in much the same manner as ordinary bricks are laid, and the entire arch of the greenhouse-roof supports itself without posts, rafters or braces. The roof and sides are, therefore, a continuous sheet of glass. These bricks have been well tested in parts of Europe, and they are found to conserve heat one-half, to render the temperature of the houses uniform and to prevent all scalding of the plants. Considering the fact that no frame-work is required, a house can be built of this material about as cheaply as in the common fashion. Most greenhouse-men who have seen the two little exhibition-houses at Chicago will, no doubt, feel that they are too dark for the growing of Roses and the forcing of vegetables; but the exhibitors say that for such houses the bricks are made of clear bright glass, while these are made of bottle glass. It is the desire of the inventor to manufacture the bricks in this country. They recommend them for sky-lights, porch-roofs, photographers' studios, propagating-pits, and the like. These bricks are the invention of Mr. Falconnier, of Nyon, Switzerland. The prices quoted in France last year were twenty-four francs per 100, and about fifty are required for a square metre.

BREVITIES.

Pecans are the subjects of four small, but very interesting, exhibits in the gallery of the north pavilion of the Horticultural Building. The Stuart Pecan Company, of Ocean Springs, Mississippi, in which W. R. Stuart, author of *The Pecan, and How to Grow It*, is a leading spirit, shows a collection of varieties in jars. These varieties are Stuart, Van Deman, Columbia, Jewett and Beauty. B. M. Young, Morgan City, Louisiana, shows an interesting series of photographs of trees, flowers and nuts, and also specimens of the following varieties: Pabst, St. Martin, Miller, Vermilion, Frotscher, and many seedlings. E. E. Risien, San Saba, Texas, shows a number of large and very fine varieties, which, however, are unnamed. He also has interesting photographs showing the top-grafting of large wild trees. The trees are "topped" twenty or thirty feet high in March, and buds are set the middle of June. The Swinden Pecan Orchard, of Brownwood, Texas, shows a picture of its Pecan orchard of 16,000 trees, together with a collection of nuts and confections, and oil and soap made from them.

Probably the most perfect single specimen of tub Fern shown at the Exposition is a plant of Cibotium Schiedei, in the collection of Pitcher & Manda. The crown of the plant is elevated to the height of six feet, yet the great leaves sweep the ground in a circle over twelve feet in diameter.

Zamia latifrons is one of the rare plants now shown at the World's Fair. Its wide few-toothed pinnæ distinguish it from its congeners. It is shown by the Allegheny City Parks.

Chicago, Ill. *L. H. Bailey.*

Recent Publications.

The Shrubs of North-eastern America. By Charles S. Newhall. New York: G. P. Putnam's Sons. 1893.

This is a companion book to the one entitled *The Trees of North-eastern America*, by the same author, which was published two or three years ago, and it is in many respects a more careful compilation than its predecessor. It aims to describe all the shrubs, not including the woody vines, which are found native in Canada, and in the United States east of the Mississippi River and north of the latitude of southern Pennsylvania, together with a few foreign shrubs which have become, to some extent, naturalized in this country. The principal value of the book is found in the illustrations, which, although they are rather coarsely done, are fairly accurate, and will serve a good purpose in helping beginners in botany to identify the various shrubs which they encounter. These illustrations, which are outlines of the forms of leaves, fruit and flowers, are accompanied by three keys or guides, which are prepared to assist the learner in tracing any given specimen to its proper family. In one of these guides the flowers are used, in another the leaves, and in the third the fruits. Besides this, there are brief botanical descriptions of each plant in which an attempt is made to translate technical language into the vernacular. Brief notes are added to these descriptions, and these might have been made a most useful part of the book, but the author does not seem to have that faculty of clear-seeing which enables trained observers to select the most important characters of a given plant, or the interesting facts of its history, or to make the most appropriate suggestions as to its value for various purposes. Sometimes the statements made in these notes are careless, they are rarely helpful, and occasionally they are not in the best taste. It is hardly worth while, for example, in a manual of this sort, to assure the student that although the Red Root is a very common shrub, it was late before the author learned to know it.

Recreations in Botany. By Caroline A. Creevey. New York: Harper & Bros.

The title of this book fairly indicates its purpose. It is one of that rapidly growing class of publications intended to arouse the interest of readers who are not likely to undertake the serious and systematic study of botany as a science, but who, it is hoped, may be allured into taking it up as a pastime, if it can be treated as an outdoor sport. The neat volume consists of a sheaf of sketches on various topics which cover a wide range, all of which are in some way botanical in their character. The Fertilization of Plants, The Compositæ, Ferns, Seeds and Fruits, Aquatic Plants, The Movements of Plants are the titles of half a dozen of the chapters, none of which occupy as much as a dozen pages, and the remaining chapters, more than twenty in all, are on subjects no less disconnected than these, each of them being a little monograph, which can be read without any reference to the rest. Of course, the information on each subject is limited, but what there is of it is fairly accurate, and, what is better, it is presented in a pleasing way, and the book will serve a good purpose if it suggests to casual readers the benefits of more systematic study. As is truly stated in the introduction, children grow up among natural objects without paying any heed to them, and anything that will encourage these young people or their parents to investigate for themselves the wonders of plant-life is distinctly useful. It is true, also, that the study of any natural science can be made pleasant, and the knowledge gained will be no less useful if it is acquired as a part of the regular summer recreation. We are inclined to think, however, that the apprehension of the classified truths of any science can only be obtained by serious, persistent and systematic application, and that students who are honest in this matter will not get on very fast or very far if they depend to any extent upon such desultory essays. Of course, a knowledge of botany is only acquired by the study of plants. And, in our view, the best aids to such studies are the regular treatises. A good purpose, however, can be subserved by this little book and others of a similar character if they induce those who may read them to settle down to steady work with some such aids as are afforded by the text-books which have been prepared by Dr. Gray. The book is very prettily printed, and the illustrations are really helpful to an understanding of the text.

Notes.

Flowers of the hybrid Cosmos are selling in great abundance in the streets of New York and Philadelphia. They now range in color from pure white to a deep crimson, and as they last a long time in water, they are a very useful addition to the flowers for cutting at this season.

Last week the agents of the Florida Fruit Exchange in this city shipped to England 3,600 boxes of Florida oranges, of

good quality, and some of them partly colored. The returns from earlier shipments show that the prices realized were equal to $2.60 a box here. The fruit carries well, and as there is now no competition with American apples, since none have yet been exported, practically the only fruit these oranges have to contend with in the Liverpool auction-rooms is the Almeria grape.

According to the *Visalia Times*, a vineyardist of that part of California has found that he can fatten a hundred hogs on the second crop of grapes in his fifty-acre vineyard. The grapes are not picked for the swine, but the swine are turned in among them and allowed to pick for themselves, which they do without injuring the vines, and in sixty days they gain an average of one hundred pounds each. The approved plan is to fence off a few acres until the swine have picked the grapes in the enclosure, and then to move the fence to another portion of the vineyard.

The flowers of the new early Chrysanthemum, Mrs. E. G. Hill, which is a seedling from Puritan and Mrs. Alpheus Hardy, were exhibited in good form on the 13th of October by the introducers of the plant, E. G. Hill & Co. The flower is of the Japanese incurved type of a delicate pink color, resembling somewhat that of a La France Rose. A medal and diploma was awarded to this plant at the World's Fair, the points considered being earliness, size, form, color and vigor of growth. The flowers are said to be seven or eight inches in diameter. They were shown on stems thirty inches long, covered with good leaves their entire length.

Among trees which assume brilliant autumn coloring the Oxydendrum of our Alleghany forests should not be forgotten. The leaves of no other American tree assume a more brilliant scarlet color in the autumn. The decorative value of this plant, nevertheless, appears to be overlooked in this country, although it has many good qualities. The habit is good, it is hardy as far north as Massachusetts, the leaves are large, bright green and lustrous, and the Andromeda-like flowers are produced in great, flat, one-sided terminal panicles at midsummer, when few other trees are in bloom; in the autumn the foliage is magnificent. The tree, which represents a monotypic genus, is exclusively American.

A copy of what is, without doubt, the first publication of Asa Gray, has recently been sent to us. It is a *Catalogue of Indigenous Flowering and Filicoid Plants growing within twenty miles of Bridgewater (Oneida County), New York.* It consists of nine pages, and is dated January 1st, 1833—that is, when the author had just entered his twenty-fourth year. This paper was published in the forty-second annual report of the Regents of the University of New York, and is included in Professor Britton's *List of State and Local Floras of the United States and British America*, although it is here entered under Onondaga County instead of Oneida County. This catalogue was omitted from the list of Professor Gray's writings, published soon after his death in the *American Journal of Science and Art*, and no reference to it appears in the reprint of a selection of his scientific papers published in 1889.

No climbing plant, except, perhaps, the Ampelopsis tricuspidata or Veitchii, of the same country, compares at this time in brilliancy of foliage with the Grape-vine of northern Japan, Vitis Coignetiæ, a species closely related botanically and of the same general appearance as our native V. Labrusca. In the forests of Yezo, V. Coignetiæ climbs into the tops of the tallest trees, filling them with its enormous leaves, which in autumn assume the most brilliant hues of scarlet. In this country it appears to be perfectly hardy, and promises to present in autumn as brilliant a spectacle as it does in its native country. It is, both in the size of its foliage and autumn coloring, a much more desirable ornamental plant than any of our American Grape-vines; and it can be planted to advantage wherever sufficient space can be given it to climb among tall trees or to cover large arbors or other edifices. The fruit, late in the season, after it has been frozen, is eaten by the Japanese, who find it palatable; the flavor, however, is not much better than that of our common wild grapes, and it is only as an ornamental plant, or as a stock on which to graft less vigorous species or varieties, that V. Coignetiæ will be found in our gardens, where it seems destined to play an important rôle.

A few plums from California are still coming, the varieties of the latest shipments being mainly Coe's Late Red and Ickworth, Fellenberg, Gros and Silver prunes. Fresh supplies cannot be expected much longer, but since the first reached here, on the 23d of June, the season of this delicious fruit has not been short. Red damsons from New York state are seventy-five cents for a ten-pound basket. California peaches have been received here in considerable quantity during the past week, among them being Bilyeu's Late October, a variety which, although it has been discarded in southern California and along the coast, is particularly adapted to the foot-hill region where it will mature. It is a large greenish white freestone peach, with a red cheek and light-colored flesh. Crawford's Late peaches, from western Pennsylvania and New York, bring one dollar and a quarter a basket. A few California quinces have come, but these seem to have been picked while green, and although they are very large, they are misshapen and unattractive. Clairgeau, Duchess, Lawrence, Vicar of Wakefield and Anjou pears are the chief ones in the market, and sell at from three to four dollars a barrel. Some large and beautiful Japanese persimmons are here from Florida, but the sales are so slow that wholesale dealers refuse to handle them. At the fancy-fruit stores they sell at from five to ten cents apiece. Bananas are abundant and cheap, those from Aspinwall and Port Limon bringing a dollar to a dollar and a quarter a bunch on the steamers, the more northern-grown fruit selling at twelve cents a bunch less for the same grade.

The last number of the *Pacific Rural Press*, which has come to hand, contains a picture of a La Marque Rose in Santa Clara, California, which is thirty-two years old and has a trunk forty-four inches in circumference. In the notice of this plant it is stated that, although this La Marque is one of the most popular climbing Roses, it is by no means the only one which reaches great dimensions. The Cloth of Gold attains as great a size and wonderful perfection of bloom, while superb specimens of Maréchal Niel, Gloire de Dijon, Rayon d'Or and William Allen Richardson, not to speak of the Banksians and Cherokees, are found everywhere. Indeed, California seems to be a land where climbing Roses attain their greatest perfection. They were among the earliest plants taken to that state. The Forty-niners cherished and preserved cuttings in their perilous journey across the plains, and the new plants found in the warm foot-hill soil just the opportunity for development that they needed, and very soon they embowered the miners' cabins and strayed off among the surrounding trees. In a land where the tenderest Rose-shoot is safe in December and January, and where the flowers begin to bloom before the winter is fairly over, it is little wonder that these plants are popular, and have become so common that there is hardly any old place where some fine specimen is not the constant joy of its owner and the wonder of every tourist. But, besides these old varieties, those of comparatively recent origin are largely growing in favor. The Climbing Devoniensis is rivaling the La Marque, while the Climbing Niphetos, Climbing Perle des Jardins, Elie Beauvillain and several others are growing in favor.

The summer's work of the New York Flower and Fruit Mission, which ended last Thursday, has been steadily carried on two days of each week since the 19th of May. The absence of heavy frosts contributed to an abundant supply of garden-flowers to the last, and nearly one hundred and fifty packages were received on the closing day. Since the first spring distribution, made up largely of Violets, Buttercups, Saxifrages, Solomon's-seal, Apple-blossoms, Lilacs, Tulips and Pæonies, the tables of the Flower Mission have been heaped with wild and cultivated flowers in their succession, ending now with Asters, Dahlias, Zinnias, Nasturtiums and Cosmos, while Mignonette, Geraniums, Ferns and Pansies contributed a large share of fragrance and brightness throughout the entire season. The primary object from the beginning, twenty-two years ago, has been to distribute flowers among the very sick of the free hospitals. Under the well-organized efforts of this association, 135 institutions have been visited regularly during the last five months, and about one hundred and twenty thousand bouquets have been distributed. Fifty city missionaries have carried cut flowers, and lately slips and potted plants, into the tenement districts, where window-gardens will be made up from cuttings sent by gardeners of country places. Contributors, as a rule, send their best flowers, summer residents in the Oranges, and as far away as eastern Long Island and Massachusetts, forwarding regularly. The express companies have repeated their liberality of former years in carrying free all packages addressed to the Mission weighing not over twenty pounds. Fruits, vegetables, fresh eggs and nuts come in considerable quantity with the flowers, and there have been many gifts of home-made jellies and preserves. The regular work of the society will not be resumed until spring, but the rooms at 104 East Twentieth Street will be open for a week beginning 19th December for Christmas gifts of greens and other materials which will help to brighten hospital-wards and the homes of the needy.